K093737

# 510(k) Summary

MAY - 4 2010

## Applicant Contact Information:


| | |
|---|---|
| Applicant: | Instrumentation Laboratory Co. |
| Address: | 180 Hartwell Road<br>Bedford, MA 01730 |
| Contact Person: | Carol Marble, Regulatory Affairs Director |
| Phone Number: | 781-861-4467 |
| Fax Number: | 781-861-4207 |


Preparation Date: December 3, 2009

## Device Trade Name:

HemosIL® FII & FV DNA Control

## Device Regulatory Information:

| | |
|---|---|
| Regulation No.: | 21 CFR 866.5910 |
| Regulation Name: | Quality Control, Genetics, DNA |
| Regulatory Class: | Class II |
| Product Code: | NZB |
| Panel: | Immunology (82) |

## Predicate Device:

| | |
|---|---|
| K083171 | INTROL™ CF Panel I Control |

## Device Description:

HemosIL FII & FV DNA Control is synthetic Factor II and Factor V DNA suspended in a non-infectious blood-like matrix. Each vial includes normal and mutated Factor II and Factor V DNA sequences and is configured as a heterozygous control for both Factor II 20210G>A and Factor V 1691G>A (Leiden) mutations.

The quality control material is validated for use with Xpert™ HemosIL® FII & FV genotyping assay on the GeneXpert® Dx System and is processed exactly as whole blood samples during the extraction, amplification and detection steps.

## Device Intended Use:

HemosIL FII & FV DNA Control is intended for the quality control of the Xpert HemosIL FII & FV genotyping assay on the GeneXpert Dx System.

## 510(k) Summary (Cont.)

**Substantial Equivalence:**

| Differences and Similarities | Predicate Device (K083171): INTROL CF Panel I Control | New Device: HemosIL FII & FV DNA Control |
|---|---|---|
| Physical Composition | Synthetic (recombinant) DNA with non-human carrier DNA, preservatives, dye and stabilizers | Same |
| Physical Format | Ready-to-use liquid | Same |
| Gene Segment | CFTR (38 mutations; 4 variants) | Factor II (20210G>A)<br>Factor V (1691G>A Leiden mutation) |
| Assay Steps Monitored | Extraction, Amplification and Detection | Same |
| Recommended Storage | 2-8°C | Same |
| Method to Validate Presence Mutations | Bi-directional sequencing | Same |
| Directions for Use | Handle control in the same manner as the patient sample | Same |

**Summary Performance Data:**

**All Test Results**

For the stability and performance studies, three lots of HemosIL FII & FV DNA Control were manufactured and tested using the Xpert HemosIL FII & FV Assay on the GeneXpert Dx system. Testing was conducted both internally at the control manufacturer and externally at multiple sites as detailed in the table on the next page.

In all cases, genotypes were called correctly.

| Number of Sites | Number of Tests | Correct Genotype: FII Heterozygous/ FV Heterozygous) | Incorrect Result | Indeterminate Result | Percent Correct |
|---|---|---|---|---|---|
| 8 | 201 | 201 | 0 | 1* | 100% |

* Operator error; one test was repeated

**Summary Performance Data (Cont.):**

**External Site Testing**

- HemosIL FII & FV DNA Control was tested at seven external sites using the Xpert HemosIL FII & FV Assay on the GeneXpert Dx System:
  - Site Nos. 1 and 2: Two clinical laboratory sites in Europe tested one lot of control daily in duplicate for six days (n=12 per site) with a different operator at each site.
  - Site No. 3: One site at the instrument/assay manufacturer (Cepheid) tested three lots of control in duplicate (n=6) with a single operator.
  - Site No. 4: One site at Instrumentation Laboratory Co. tested one lot of control in singlicate for thirty days (n=30) with a single operator and a second lot of control in singlicate for 6 days (n=6).
  - Site Nos. 5-7: Three clinical laboratory sites in the United States tested one lot of control in singlicate for ten days (n= 10 per site) with a different operator at each site.

  In all cases, genotypes were called correctly.

| Site | Number of Tests | Correct Genotype: FII Heterozygous/ FV Heterozygous) | Incorrect Result | Indeterminate Result | Percent Correct |
|---|---|---|---|---|---|
| Site No. 1 | 12 | 12 | 0 | 1* | 100% |
| Site No. 2 | 12 | 12 | 0 | 0 | 100% |
| Site No. 3 | 6 | 6 | 0 | 0 | 100% |
| Site No. 4 | 36 | 36 | 0 | 0 | 100% |
| Site No. 5 | 10 | 10 | 0 | 0 | 100% |
| Site No. 6 | 10 | 10 | 0 | 0 | 100% |
| Site No. 7 | 10 | 10 | 0 | 0 | 100% |

* Operator error; one test was repeated

**Summary Performance Data (Cont.):**

**Reproducibility**

**NOTE:** Although HemosIL FII & FV DNA Control is a qualitative control (genotype present or absent), the GeneXpert Dx provides numerical system outputs, crossing thresholds (Cts), that can be tracked and analyzed as an indicator of DNA quantity in the following studies.

- **Within-Run Testing:** With-in run reproducibility was demonstrated with one operator by testing two lots of HemosIL FII & FV DNA Control in replicates of five using a single lot of Xpert HemosIL Factor II & Factor V Assay on the GeneXpert Dx instrument. Additionally, five replicates of one Control lot were tested using a second lot of HemosIL Factor II & Factor V Assay.

  In all cases, genotypes were called correctly. Within-run reproducibility was excellent, with Ct SD < 1.0.

| | | | | FII G Normal | | FII A Mutant | | FV G Normal | | FV A Mutant | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Lot # | No. of Tests | Assay Lot # | Correct Results (FII Heterozygous/ FV Heterozygous) | Mean Ct | SD | Mean Ct | SD | Mean Ct | SD | Mean Ct | SD |
| A21FEB08 | 5 | 201 | 5 | 27.3 | 0.4 | 26.4 | 0.5 | 27.3 | 0.6 | 27.4 | 0.7 |
| B26FEB08 | 5 | 201 | 5 | 27.0 | 0.5 | 25.9 | 0.4 | 26.8 | 0.4 | 27.0 | 0.3 |
| A21FEB08 | 5 | 301 | 5 | 25.9 | 0.3 | 25.4 | 0.3 | 26.1 | 0.4 | 26.2 | 0.4 |

- **Lot-to-Lot Testing:** Lot-to-lot reproducibility was demonstrated by testing three lots of HemosIL FII & FV DNA Control using a single lot of Xpert HemosIL Factor II & Factor V Assay on the GeneXpert Dx instrument.

  In all cases, genotypes were called correctly. No significant differences were seen between control lots, with Ct SD < 1.0 and %CV < 4.0.

| | | | FII G Normal | | | FII A Mutant | | | FV G Normal | | | FV A Mutant | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Lot # | No. of Tests | Correct Results (FII Heterozygous/ FV Heterozygous) | Mean Ct | SD | %CV | Mean Ct | SD | %CV | Mean Ct | SD | %CV | Mean Ct | SD | %CV |
| A21FEB08 | 22 | 22 | 26.4 | 0.7 | 2.5% | 25.9 | 0.6 | 2.5% | 26.8 | 0.8 | 2.8% | 27.0 | 0.8 | 2.9% |
| B26FEB08 | 17 | 17 | 26.4 | 0.6 | 2.4% | 25.9 | 0.6 | 2.4% | 26.7 | 0.7 | 2.5% | 27.0 | 0.7 | 2.7% |
| A28FEB08 | 15 | 15 | 26.6 | 0.7 | 2.5% | 26.0 | 0.7 | 2.7% | 26.9 | 0.8 | 2.8% | 27.0 | 0.8 | 3.0% |
| All | 54 | 54 | 26.4 | 0.7 | 2.5% | 25.9 | 0.6 | 2.5% | 26.8 | 0.7 | 2.7% | 27.0 | 0.8 | 2.8% |

## 510(k) Summary (Cont.)

**Summary Performance Data (Cont.):**

### Reproducibility (Cont.)

- **Repeatability Testing:** Repeatability of Control lots was demonstrated by testing three lots of HemosIL FII & FV DNA Control using three different lots of Xpert HemosIL Factor II & Factor V Assay on the GeneXpert Dx instrument at multiple sites performed by multiple operators. In all cases, genotypes were called correctly. The three control lots demonstrated similar signal, with Ct SD < 1.0 and %CV < 4.0.

| | | | FII G Normal | | | FII A Mutant | | | FV G Normal | | | FV A Mutant | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Lot # | No. of Tests | Correct Results (FII Heterozygous/ FV Heterozygous) | Mean Ct | SD | %CV | Mean Ct | SD | %CV | Mean Ct | SD | %CV | Mean Ct | SD | %CV |
| A21FEB08 | 45 | 45 | 26.5 | 0.9 | 3.3% | 25.9 | 0.8 | 3.0% | 26.8 | 0.9 | 3.3% | 27.0 | 0.9 | 3.2% |
| B26FEB08 | 122 | 122 | 26.1 | 0.7 | 2.7% | 25.3 | 0.7 | 2.6% | 26.2 | 0.8 | 2.9% | 26.2 | 0.8 | 2.9% |
| A28FEB08 | 34 | 34 | 26.8 | 0.6 | 2.2% | 26.0 | 0.6 | 2.3% | 26.9 | 0.7 | 2.4% | 26.9 | 0.7 | 2.6% |
| All Lots | 201 | 201 | 26.3 | 0.8 | 2.9% | 25.6 | 0.7 | 2.8% | 26.5 | 0.8 | 3.0% | 26.6 | 0.8 | 3.1% |

- **Operator Testing (Single vs. Multiple):** Control results of one operator were compared to the control results of seven other operators. In all cases, genotypes were called correctly. There was no significant difference in mean Cts or reproducibility of Cts when test results of one operator were compared to those of multiple operators, with Ct SD < 1.0 and %CV < 4.0.

| | | | FII G Normal | | | FII A Mutant | | | FV G Normal | | | FV A Mutant | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. of Operators | No. of Tests | Correct Results (FII Heterozygous/ FV Heterozygous) | Mean Ct | SD | %CV | Mean Ct | SD | %CV | Mean Ct | SD | %CV | Mean Ct | SD | %CV |
| 1 Operator | 51 | 51 | 26.6 | 0.7 | 2.6% | 25.9 | 0.6 | 2.4% | 26.9 | 0.7 | 2.6% | 27.0 | 0.8 | 2.8% |
| 7 Other Operators | 55 | 55 | 26.5 | 0.8 | 2.8% | 25.7 | 0.8 | 3.1% | 26.7 | 0.9 | 3.3% | 26.8 | 0.9 | 3.3% |
| All Operators | 106 | 106 | 26.6 | 0.7 | 2.7% | 25.8 | 0.7 | 2.8% | 26.8 | 0.8 | 3.0% | 26.9 | 0.8 | 3.1% |

DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration
10903 New Hampshire Avenue
Document Mail Center – WO66-0609
Silver Spring, MD 20993-0002

Instrumentation Laboratory Co.
c/o Ms. Carol Marble
Regulatory Affairs Director
180 Hartwell Road
Bedford, MA 01730

MAY 0 4 2010

Re: k093737
Trade/Device Name: HemosIL FII & FV DNA Control
Regulation Number: 21 CFR §866.5910
Regulation Name: Quality control material for cystic fibrosis nucleic acid assays
Regulatory Class: Class II
Product Code: NZB
Dated: March 31, 2010
Received: April 1, 2010

Dear Ms. Marble:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

If your device is classified (see above) into class II (Special Controls), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must

comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR 803); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820). This letter will allow you to begin marketing your device as described in your Section 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Parts 801 and 809), please contact the Office of *In Vitro* Diagnostic Device Evaluation and Safety at (301) 796-5450. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to http://www.fda.gov/MedicalDevices/Safety/ReportaProblem/default.htm for the CDRH's Office of Surveillance and Biometrics/Division of Postmarket Surveillance.

You may obtain other general information on your responsibilities under the Act from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 796-7100 or at its Internet address http://www.fda.gov/cdrh/industry/support/index.html.

Sincerely yours,

Geena Philip

for Maria M. Chan, Ph.D
Director
Division of Immunology and Hematology Devices
Office of *In Vitro* Diagnostic Device Evaluation and Safety
Center for Devices and Radiological Health

Enclosure

## Indications for Use Statement

**510(k) Number (if known):** K093737

**Device Name:** HemosIL® FII & FV DNA Control

**Indications for Use:**

HemosIL FII & FV DNA Control is intended for *in vitro* diagnostic use as a heterozygous quality control to monitor analytical performance of the extraction, amplification and detection steps of the Xpert™ HemosIL FII & FV genotyping assay on the GeneXpert® Dx System used in the detection of both the Factor II 20210G>A and Factor V 1691G>A (Leiden) mutations.

Prescription Use √ (Part 21 CFR 801 Subpart D) **OR** Over-The-Counter Use _____ (21 CFR 807 Subpart C)

(PLEASE DO NOT WRITE BELOW THIS LINE - CONTINUE ON ANOTHER PAGE IF NEEDED)

Concurrence of CDRH, Office of In Vitro Diagnostic Devices (OIVD)

Division Sign-Off

Office of In Vitro Diagnostic
Device Evaluation and Safety

510K K093737